

WEATHER IN THE UNITED STATES

[Climatological Division, OLIVER L. FASSIG, in Charge]

THE WEATHER ELEMENTS

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GENERAL SUMMARY

The weather during November was abnormally warm in most sections from New England westward to the Great Plains. In the more southern States the temperature averaged from 4° to 7° above the normal while in the Great Plains it was only slightly above. On the other hand, from the Rocky Mountain region to the Pacific coast subnormal temperature prevailed, although the departures were but a few degrees below the seasonal average.

The precipitation for the month was abnormally heavy throughout much of the upper Mississippi and lower Missouri Valleys, with an area including central and western Iowa, northwestern Missouri, eastern Kansas, and central Oklahoma reporting from four to five times the normal. Likewise portions of southern Arizona received nearly five times their normal. On the other hand, portions of the Southeast and Northwest received no appreciable precipitation during the month, and portions of the Eastern States from New England to Alabama received less than 25 per cent of the seasonal average; also southern and western Texas and portions of the northern Great Plains, the Pacific Northwest, and northern California received subnormal amounts. Snowfall was moderately heavy over the Rocky Mountain region, but only slight amounts were reported to the eastward.

TEMPERATURE

The first week was generally cool in the eastern and south-central portions, but warm elsewhere, being particularly warm compared with normal in the middle and northern Plains, Rocky Mountain, and Plateau States. From the beginning of the second week till the 24th, decided warmth for November prevailed in the eastern half of the country, and until about the 17th the Plains States and New Mexico usually had warm weather. In the central valleys and to northeastward over the upper Ohio Valley and most of the Lake region the warmth was beyond precedent at this time of year, the departure from normal being about 20°.

Much colder weather set in over most of the Rocky Mountain and Plateau States about the middle of the month, and the Plains States and nearly all of the Mississippi Valley gradually came under its influence as the final decade passed; but the South Atlantic and East Gulf States remained warmer than normal. The last ten days of November were remarkably cold in Montana, Idaho, Utah and large portions of adjoining States.

November averaged colder than normal near and to the westward of the Rocky Mountains, notably in the northern and middle Plateau region and the interior counties of the Pacific States, where it was 4° to 6° colder than normal.

At Eureka, Calif., and Boise, Idaho, this was the coldest or almost the coldest November of record. Some stations in southern California and Montana reported it the first month with mean temperature below normal since the fall of 1930.

Between the western Plains and the Mississippi River, likewise in the Florida Peninsula, this month was moder-

ately to considerably warmer than normal. East of the Mississippi River, save in the Florida Peninsula, this month was almost invariably the warmest November of record. From Tennessee and Missouri northeastward over the Lake region the month averaged 8° to 11° above normal.

The highest marks of several Southwestern States were above 95°. In most States they were in the 80's, but in the majority of northern border States between 75° and 80°. To the westward of the Mississippi River they almost invariably occurred not later than the 8th, but to the eastward usually just before the middle of the month or about the 22d.

The lowest temperatures of the far Western States were considerably below zero, one elevated station in Colorado reporting -41°. In the northern Plains and Minnesota they were several degrees below zero, but in and to the eastward of the middle and lower Mississippi Valley they were mainly between 14° and freezing. In the southeastern quarter of the country the 7th was, as a rule, the coldest day; otherwise the lowest readings occurred almost always on some day of the last decade of the month.

PRECIPITATION

The first decade was a period of decidedly little precipitation, although the North Pacific States were favored. The middle decade and the first half of the last decade brought important precipitation to considerable portions of the Pacific and Plateau regions, also to most of the Plains, the Mississippi Valley, and the upper Lake region, the amounts being notably large in Iowa, Wisconsin and the northern parts of Missouri and Illinois, also considerable portions of Kansas and Oklahoma.

The last few days of November saw somewhat better distribution of precipitation. Moderate to locally heavy falls occurred almost throughout the Ohio and lower Mississippi Valleys and eastern Texas. There continued, however, to be very little rainfall, or locally none at all, in most of Georgia and large parts of the Carolinas, northern Florida, and southeastern Alabama.

The month brought more ample precipitation than the earlier fall months, except near the Atlantic and east Gulf coasts and in a few small areas elsewhere. There usually was moderately less than normal, however, near the Appalachian crest and for a few hundred miles or more to the northwestward, and in the lower Lake region, southern Mississippi and adjacent areas, central and southwestern Texas, the Black Hills region, and the western half of North Dakota. In the Pacific Northwest amounts often were somewhat less than normal.

There was generally a moderate excess above normal in Colorado, New Mexico, Arizona, southern California, the northern Plateau region, and from the eastern parts of the Dakotas to the upper Lake region. At Phoenix, Ariz., the rainfall was 3.18 inches, nearly five times the normal, and with one exception the greatest November amount ever known there.

Rainfall was decidedly heavy for late fall from central Oklahoma northeastward to Iowa, most stations measuring from four to six times their November normal quantities, and exceeding, often by 1 or 2 inches, the previous greatest November precipitation of the locality. As far southwestward as the northwestern part of Texas, and as far eastward as Arkansas, the lower Ohio Valley,

western Indiana, and the vicinity of Lake Michigan there was considerably greater precipitation than normal.

As an indication of the plentiful water supply in recent months over the north-central part of the country, the river stage at St. Louis, Mo., may be noted. On November 30 this reached 22 feet, which was 8 feet below flood stage, but was higher than any previous stage since the latter part of June, 1929.

SNOWFALL

There was practically no snowfall anywhere during the first decade. The middle decade brought a little snow in the northernmost districts from central North Dakota to the western end of Lake Superior and considerable over most of the northern Plateau region, 12 inches falling at Salt Lake City, Utah. During the final decade snowfall occurred in most districts where it is expected by the end of November, though scarcely any fell to the southward of the northern boundaries of Arkansas, Kentucky, and the Virginias. From the lower Missouri Valley to New Jersey a narrow strip received from 2 to 6 or 7 inches about the 26-27th. However, several districts farther northward, particularly large portions of Wisconsin and lower Michigan, received no measurable snow before November ended and most of the Lake region and northern New England had far less than normal.

Most of the Plateau region received snowfall during the closing decade, and some districts a short distance to the

eastward of the Divide had unseasonably heavy falls, Denver, Colo., recording almost 15 inches and El Paso, Tex., over 2 inches.

The month's total snowfall was usually less than normal in the eastern half of the country, except moderately above normal from Indiana to New Jersey. In the Plains States and to the westward it was mainly greater than normal. In Idaho the average fall was larger than in any previous November of record, and the records were approached in Utah, Arizona, and New Mexico.

SUNSHINE AND RELATIVE HUMIDITY

The sunshine during November was slightly above the normal locally in the Southeast, the northern Great Plains, the Lower Lakes, and north Pacific areas. Elsewhere it was below the seasonal average, the deficiency being rather pronounced in portions of the upper and central Mississippi and lower Missouri valleys and the central Great Plains.

The relative humidity during the month was generally above the normal from the Plateau and Rocky Mountain regions eastward, except in portions of the southeast and northwest, and locally in the Lake region, where the average was as a rule slightly below. Throughout the Pacific States the humidity was generally below the normal although the departures were small, for the most part.

SEVERE LOCAL STORMS, NOVEMBER, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Mapleplain, Minn. (vicinity of)	16	9:35 p. m.			\$12,000	Tornado	Some farm buildings totally demolished or badly damaged; telephone poles leveled for half a mile; path 5 miles long.	Official U. S. Weather Bureau.
Lindale (near), Tex.	17	5 a. m.	200		3,500	do.	Buildings damaged at Thedford Switch.	Do.
Longview, Tex.	17	6 a. m.				Wind	8 oil derricks blown down in Spring Hill community.	Do.
Ludington, Mich.	20	11:30-2:40 p. m.				do.	Poles and overhead wires damaged; 1 person injured.	Do.
Charles City, Iowa, and vicinity.	20	2:14 p. m.			15,000	Thunderstorm and wind.	Airplane wrecked and another damaged; garage unroofed; buildings on 7 farms damaged.	Do.
Trempealeau County, Wis.	20	4 p. m.			15,500	Squall winds.	Schoolhouse and several small buildings wrecked, others damaged; livestock killed.	Do.
Winnsboro (near), La.	20					2 small tornadoes.	Some small buildings demolished, several others damaged; poultry and pigs killed.	Do.
Santa Fe, N. Mex., and vicinity.	21-22				1,000	Wind.	Signs, roofs, awnings, and outbuildings damaged.	Do.
Castron, Valencia, McKinley, San Juan, Rio Arriba and Sandoval Counties, N. Mex.	21-23			9	50,000	Snow, wind, and cold.	Many Indians badly frozen; thousands of sheep lost.	Do.
Amarillo, Tex.	22					Rime.	Much damage to telephone and light wires.	Do.
Barton, Rush, and Ness Counties, Kans.	22-23				10,000	Sleet and glaze.	157 poles broken down; 1,000 breaks in wires; power and telephone service greatly hampered.	Do.
Butler, Polk, York, and Fillmore Counties, Nebr.	22-23				80,000	Ice.	Considerable injuries to trees and overhead wires.	Do.
Monroe, Audubon, Mahaska, Wapello, Fremont, Mills, and Pottawattamie Counties, Iowa.	22-23					Heavy rains and floods.	Considerable damage to crops, especially unhusked corn, by inundating of farm lands; fences and wooden bridges damaged.	Do.